

**THE WORKSHOP OF JAMES WATT.**

Heathfield Hall, near Birmingham, was for many years the residence of James Watt, the famous engineer, a fact which gives it historical interest.

The Hall stands almost in the very heart of the populous suburb of Handsworth, but concealed therefrom by a belt of forest trees, and the latter and happiest portion of the life of the great inventor was spent within its walls.

Happily, although much of the Heathfield estate has been handed over to the road makers and builders, and the house itself is threatened, the small room, or garret, which Watt utilized as a workshop, and in which he often spent several days and nights without leaving it, yet remains, with all the tools, furniture, partly developed inventions, etc., in exactly the same position as when he turned his back upon it for the last time. This "classic garret," situated immediately under the roof in the back part of the house, and approached by a narrow staircase, is a small room, with plain whitewashed walls and ceiling, and lighted, though insufficiently, by a low, broad window looking into the shrubbery. The most conspicuous objects therein, as shown in our sketch, are two sculpture-copying machines, invented by Watt, by means of which he produced replicas of

and we sincerely trust that it will meet with a favorable reception, and that the necessary funds will be speedily forthcoming to enable them to effect this praiseworthy object.—*London Graphic.*

**Structure of Steel.**

In a recent discussion before the Iron and Steel Institute, Sir Henry Bessemer gave some interesting particulars of an experiment he had made thirty years ago, suggested by observing the difference between French and English lump sugar. The English sugar has a much larger crystal than that made in France, and in the latter the material is cooled quickly and stirred while cooling, while English sugar is allowed to stand and crystallize slowly. Sugar candy stands for days while it is in process of crystallization, the operation being retarded by the application of heat. In this case the crystals are very bold and pronounced. It is also known that in heavy castings, where the heat is kept in a long time by the mass, large crystals are apt to be formed. The experiment referred to was made in the following manner :

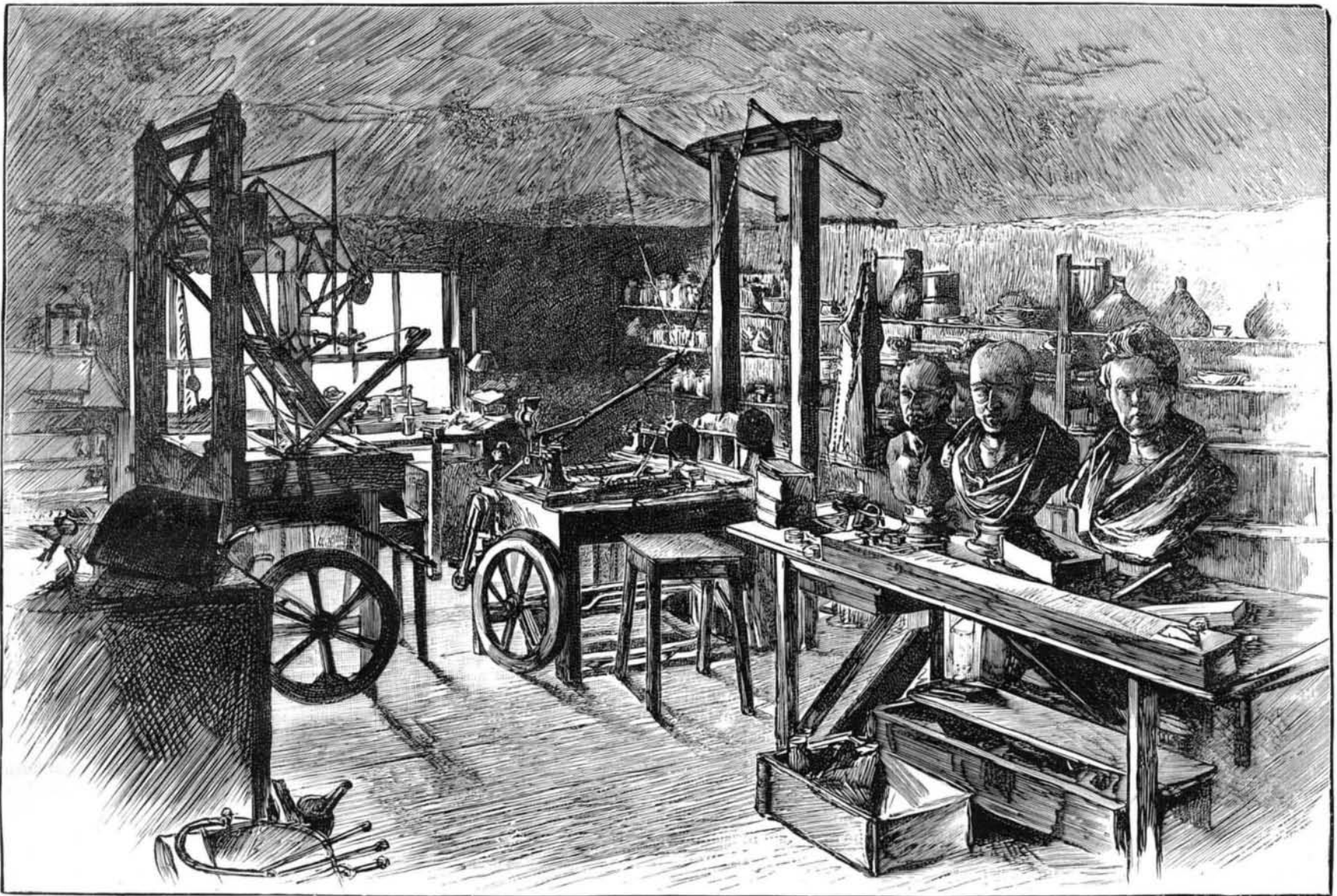
A hole was made in the earth, and this was lined with sand ; into this a mould that would produce a spherical casting was placed. Between the mould and

**Cost of Drilling a Gas Well.**

The cost of drilling a gas well is stated by a Pittsburg contemporary to be about the same as that of an oil well under the same conditions. It varies usually from \$3,500 to \$6,000 according to the depth. Where the productive measures are nearer the surface, the cost is materially less. The method pursued is the same in both cases. A derrick is first set up on the intended site of the well, and a wrought iron pipe driven through the soft earth until it reaches the solid rock, usually at a depth of 60 to 100 feet. The weight of the drills with the attached "jars" is 3,000 to 4,000 pounds. These rise and fall four to five feet, and are constantly rotated, so as to bring the bit into contact with the entire circumference of the drilling. For a depth of 500 feet the hole is bored 8 inches in diameter, and is cased with 5½ piping. Beyond this depth the hole is continued with a diameter of 6 inches until gas is reached or the well abandoned. A casing of 4 inch piping is used for this lower portion. Under ordinary circumstances, forty to sixty days are required for the drilling.

**Ordinance Supplies.**

The following is the bid of the Midvale Steel Company, of Philadelphia, Pa., on steel forgings for the



**THE WORKSHOP OF JAMES WATT AT HEATHFIELD, NEAR BIRMINGHAM.**

THIS ROOM HAS NOT BEEN DISTURBED SINCE THE DEATH OF WATT IN 1819.

medallions and busts, which he afterward sent to his friends as the work of " a young artist in his eighth year."

Among other relics of this famous man we noticed, on one of the shelves that line the room, a plate containing a withered bunch of grapes, a large packet of snuff (its scent has long since fled), his clay tobacco pipe, and last, but not least, the identical wash-leather apron in which Watt was accustomed to do his work, the chemical stains on it bearing silent testimony to the patient, practical labors of its illustrious possessor.

A proposal is now being considered by the Birmingham authorities to remove this historical collection to Aston Hall, the various articles to be arranged in a suitable room in as nearly as possible the same relative positions as they now occupy. Interesting and valuable they must be wherever placed, but in another building and in another neighborhood they will not appeal to our imagination so powerfully, or excite the same emotions, as they do when we see them in the room where the inventor worked, and which must always be associated with his name.

In order that this proposed act of vandalism may not be carried out, a suggestion has been made to Mr. J. W. Gibson Watt, a descendant of James Watt, to purchase Heathfield Hall and the grounds belonging to it, to be utilized as a public park and museum in memory of Watt. The matter is now before the trustees,

the sand a quantity of charcoal was packed. The mould then had a quantity of malleable iron made on the Bessemer process poured into it, and the whole was covered up for ten days. The metal had a heavy dose of phosphorus, ½ to ¾ per cent, but no carbon. At the end of the ten days the globular mass was dug out. A smart tap with a two pound hammer had the effect of sending off a shower of crystals, and there appeared to be no cohesion among the particles of the mass. On hammering one of the crystals on an anvil, it could be flattened down, thus showing that each individual crystal was a particle of malleable iron, although the cohesion of the crystals to each other was so slight. Sir Henry thought this experiment worth detailing, as it tended to show the great importance of the time allowed for cooling in iron and steel.

**Scarlet Fever.**

Another case showing the communicability of contagious diseases by clothing is reported from Bath, Me., where a girl had scarlet fever at a boarding school. After recovery she returned home, and a trunk containing the clothing she wore while sick was put away in the garret. Six months later two little children were playing in the garret, and, opening the trunk, took out some of the clothing. In a week both were taken very ill with the disease, and one died. There were no other persons ill with scarlet fever in the community.

Ordnance Department: 10 and 12 inch forgings for breech block, 44 cents per lb. ; 8 inch forgings for breech block, 75 cents per lb. ; forgings for spindle, 54 cents per lb. ; forgings for race plate, 64 cents per lb. ; forgings for block carrier, 80 cents per lb. ; forgings for lever, 64 cents per lb. ; forgings for hinge pins, 64 cents per lb. ; forgings for bushing ring, 45 cents per lb. ; forged bar for securing rings, 64 cents per lb. ; and forgings for gas check rings, 64 cents per lb.

The same company put in the following bid on mortar hoops : Rolled hoops, 36 cents per lb. ; trunnion hoop, \$1 per lb.

The bid for furnishing cannon, carriages, etc., was as follows : Hotchkiss & Co., 6 Hotchkiss revolving cannon, 37 millimeters caliber (1.45 in.), \$7,800 ; carriages, \$3,000 ; limbers, \$2,250 ; accessions in reserve parts for guns and carriages, \$1,050 ; ammunition wagons, \$4,500 ; accessions for wagons, \$600 ; loading tools, \$100 ; percussion shells, fuse, cartridge case, and wad, \$1 each ; canister shot, 62 cents each.

The following are the bids on cored shot : West Point Foundry Association—shot, \$29 each ; copper bands, \$2.25 each. South Boston Iron Works, Boston, Mass.—\$30.30 and \$2. Talbott & Sons, Richmond, Va.—\$30 and \$2. Tredegar Company, Richmond—\$60 and \$3.

The bids for supplying the army with a cast iron body for a 12 inch mortar were : South Boston Iron Works, Boston, Mass., \$3,500 ; Builders' Iron Foundry, Providence, R. I., \$5,000.